Toy Industry Association, Inc.

Chemical Alternatives Assessment Practices in the Toy Industry

Presented by Alan Kaufman
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Sacramento, California | September 15, 2011

TIA's Long History of Leadership in Toy Safety

TIA's toy safety assurance program focuses on developing standards, educating the industry to ensure compliance and guiding caregivers on safe play

1930s	1940s	1950s	1970s	1990s	2000s	2010-
TIA institutes its Safety Standards Committee and begins partnership with the National Safety Council (NSC).	TIA and NSC collaboration leads to establishment of a National Accident Reporting Service.	TIA and NSC efforts continue with development of National Clearinghouse for Toy Injuries. TIA joins with American National Standards Institute (ANSI) to develop a standard for the coating finishes on toys and other children's articles.	TIA leadership results in publication of first comprehensive national toy safety standard (known today as ASTM F963). TIA launches a Toy Safety Educational Program.	TIA institutes an annual Toy Safety Conference for Chinese manufacturers in conjunction with the U.S. Consumer Product Safety Commission (CPSC) and Chinese government.	TIA advocates for mandatory toy safety testing; works with legislators to develop enhanced, uniform toy safety laws; and develops safety compliance best practices. Congress passes Consumer Product Safety Reform legislation.	TIA develops **www.ToyInfo.org** website as a resource for parents and other caregivers on safe and fun toys and the importance of play.

What are Drivers for Alternatives Assessment?

- Toy manufacturers, importers, and retailers routinely perform design reviews and alternatives assessments of chemicals found in toys, striving to design safe product that is also **manufacturable, performs acceptably and addresses all aspects of safety – mechanical/physical, electrical, flammability … *as well as* chemical risks.**

- **Not only is this the responsible thing to do (companies are made up of people actively working to avoid user risk and who typically have children and families of their own), it is good business practice as it minimizes liability exposure and reputational/brand risks.**

- EU Toy Safety Directive (many SMEs and all large producers distribute in the EU)
  - Requires full design review, including chemical safety assessment; this formalizes what was standard industry practice-comparison of alternatives and selection of safest option.

Addressing Sensitive Populations

- While recognizing that children may be exposed to specific risks not present for the general population simply because they are children, the toy industry routinely considers safety risks to be stratified by age. Some age groups are subject to risks not relevant for other age cohorts.

  Some examples of age-dependent risk and specific requirements to address them are:

  - Based on mouthing behavior of children aged three years and younger, small objects (even those accessible only after abuse testing) are banned from products for this age group
  - Since oral route of exposure is of greatest concern for phthalate plasticizers, special attention is paid to mouthability of components; mouthing behavior is prevalent up to age three years, and virtually disappears above this age. Three phthalates (DINP, DIDP, and DnOP) are prohibited in toy components which have any dimension less than five centimeters, a proxy for being able to fit in a child's mouth
  - Cord lengths are limited for very young children to avoid strangulation risk
  - Electrical toys with heating elements are not allowed below age eight years

Case Studies of Alternative Assessment and Ingredient Replacement or Confirmation

- Black iron oxide (Fe_3O_4) substituted for carbon black powder in a toy fingerprint kit – concern about possible fibrosis and contamination with polynuclear aromatic hydrocarbons (PAHs).
- Corn starch substituted for talc in educational toy out of concern for contamination with asbestos.
- 1,5 pentanediol use avoided as solvent in liquid preparations – concern about possible substitution with 1,4-butanediol (recreational drug).
- Polycarbonate remains material of choice for protective gear (goggles, helmets, etc.) and toys requiring a high degree of toughness despite containing low levels of non-migrating Bisphenol-A (BPA).

Future Enhancements

- Industry (TIA and TIE) actively developing automated chemical safety assessment tools which could be applied across the industry in a uniform manner.

- Ideally, tools would evaluate product for chemical hazard, exposure, and risk without requiring specialized knowledge on part of user, and would utilize published, peer-reviewed chemical data.

- Of course, absolute scoring and relative ranking of chemicals/mixtures would be desired goals.

Conclusions

- The toy industry routinely …
  1) Performs design reviews and alternatives assessments of chemicals found in toys
  2) Assesses and accounts for differing population vulnerabilities
  3) Makes material substitutions when data and test results warrant them and no unacceptable tradeoff in other safety characteristics (e.g. impact resistance) or performance is created by substitution

- The toy industry is proactively exploring automated tools for chemical safety assessments.

- Alternatives assessment process must not force change to a "safer" alternative *based on mere presence of an allegedly hazardous chemical* – risk and exposure, effect of substitution on other safety characteristics or performance, and other tradeoffs which might be created must also be considered.

Thank you!

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